

What is claimed is:

1. A compound that is effective in inducing expression of proteins under control of a lac-based promoter, said compound being stable at ambient temperatures.

5

2. The compound of claim 1 that is a C-glycoside analog of isopropyl- $\beta$ -D-thiogalactopyranoside (IPTG).

3. A C-glycoside analog of IPTG.

10

4. The C-glycoside of claim 3 that is functionally equivalent to IPTG.

5. The C-glycoside of claim 4 whereby the recombinant proteins are under control of the *lac* promoter.

15

6. The C-glycoside of claim 3 that is stable at ambient temperatures.

7. The C-glycoside of claim 2 that is isobutyl-C-galactoside (IBCG), its analogues, biologically active salt forms, and optical isomers thereof.

20

8. Isobutyl-C-galactoside.

9. A method of inducing protein expression comprising: adding a C-glycoside of IPTG to a bacterial culture.

25

10. The method of claim 9 whereby the bacterial culture is *Escherichia coli*.

11. The method of claim 10 whereby the C-glycoside of IPTG binds with the *lac* repressor in the *Escherichia coli*.

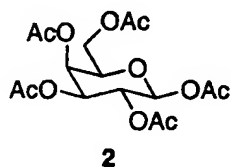
30

12. The method of claim 9 whereby the C-glycoside is added to a final concentration of between about 0.05-2.0 mM.
13. The method of claim 9 that does not require multiple additions of the C-glycoside.
- 5 14. The method of claim 9 further including the step of storing the C-glycoside at ambient temperature.
- 10 15. The method of claim 9 whereby the C-glycoside of IPTG is IBCG, its analogues, biologically active salt forms, and optical isomers thereof.
16. A method of synthesizing a C-glycoside of IPTG comprising: treating galactose pentaacetate with methallyltrimethylsilane in the presence of boron trifluoride etherate.
- 15 17. A method of synthesizing a C-glycoside of IPTG comprising: treating a halo-acetogalactose with an excess of an organomagnesium halide to provide a C-linked glycoside.
18. The method of claim 17 further including the step of deprotecting acetyl groups in the C-linked glycoside with sodium methoxide.
- 20 19. A method of inducing protein expression comprising adding a C-glycoside of IPTG to a plant cell.
- 25 20. The method of claim 19 wherein the plant cell comprises an expression system having a lac-based promoter.
21. The method of claim 19 wherein the lac-based promoter is a *lac* promoter.
- 30 22. The C-glycoside of claim 3 that is functional as a galactose substitute.

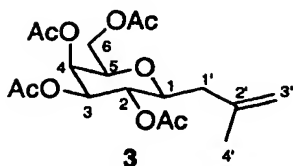
23. The compound of claim 1 wherein the lac-based promoter is selected from the group consisting of lac, tac, and trc.

24. The compound of claim 23 wherein the promoter is an *Escherichia coli* lac promoter.

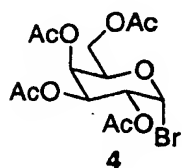
25. A caged compound of formula:



26. A caged compound of formula:



27. A caged compound of formula:



28. A caged compound of formula:

